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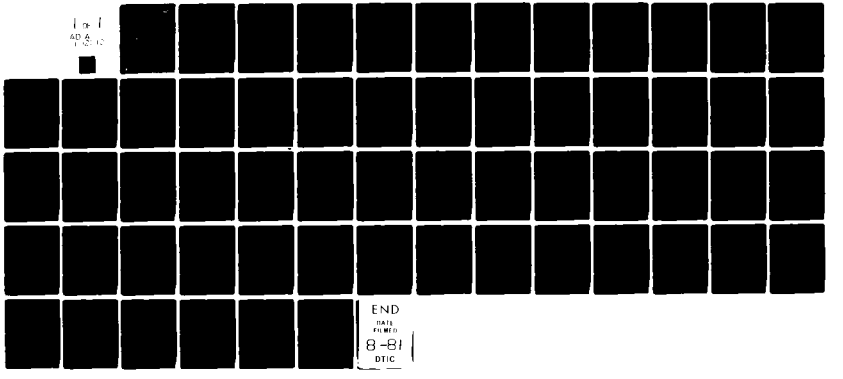

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HAROLD MINDLIN, MANAGER
J. F. LYNCH, ASSOCIATE MANAGER
BATTELLE-COLUMBUS
Columbus, Ohio

ANNUAL REPORT — CONTRACT DLA900-78-C-1715

Approved for public release; distribution unlimited.

Prepared for

ARMY MATERIALS AND MECHANICS RESEARCH CENTER
Watertown, Massachusetts 02172

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)

This report reviews the continuing operations and development of the Metals and Ceramics Information Center for the period of May 1, 1980 through April 30, 1981. Activity and growth of the Center are discussed in terms of the major work areas: Information, Operations, Products and Services, Service-Charge Program, Marketing, and Management. Future plans for the Center also are included.

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SUMMARY

The Metals and Ceramics Information Center (MCIC) is one of the technical Information Analysis Centers (IAC's) chartered and sponsored by the Department of Defense (DoD). The objective of the Center is to increase the productivity of scientists, engineers, and technicians engaged in scientific and engineering programs for the DoD. The Center is responsible for the collection, review, analysis, appraisal and summary of the available scientific and technical information and data on selected metals and ceramics. The resources and capabilities of MCIC, a full-service IAC, are also available to the technical community at large through an extensive program of products and services.

This third Annual Report on Contract No. DLA900-78-C-1715 covers the program activities for the period 1 May 1980 through 30 April 1981. Operating statistics and contract status reports are provided for the Twelfth Quarter and the complete reporting period. During this 12-month contract period, the Center met is contractual goal for recovery of products and service costs. Actual annual income from the sale of products and services was $93,409; income from special tasks and related activities was $481,973. This total income of $575,382 resulted in a cost recovery of 76.2 percent relative to the basic funding ($755,000). As noted, a substantial portion of MCIC's income continues to come from the special studies and tasks undertaken for Federal agencies; 9 studies/tasks were conducted in this report period. The operations of the Center have been affected by rising costs, but basic services are being maintained.

In addition to the information acquisition and processing efforts, technical publications and inquiry services remain the major activities in MCIC's basic program. The issuance of the Current Awareness Bulletin was changed to a monthly distribution to approximately 3600 technical personnel. The publications completed, reprinted or in process consist of:

- 18 Current Awareness Bulletins (CAB)
- 4 technical reports
- 4 new handbooks.

The Center continued to give high priority responses for technical assistance (of these incoming requests, 269 were processed and 120 were cancelled). Of the assigned requests, 56 were subject to user change and 213 were answered free of charge. An average of 67 inquiries per quarter are now handled by MCIC.

Utilizing the RDT&E On-Line System at the Defense Technical Information Center, the information base added 3,619 technical documents to the MCIC information system. Included in the annual total are 889 documents accessed to the Twelfth Quarter. Our inventory of technical documents now lists approximately 130,000 items.

Future plans are for the continuation of the primary and established products and services of the Center. The future operations include:

(1) Keeping the data base and information system current and useful

(2) Identifying and producing specific products and services needed by the users

(3) Developing a greater visibility of the Center

(4) Providing cost-effective service

(5) Develop a close working relationship with DTIC.

PREFACE

This report was prepared by the Metals and Ceramics Information Center (MCIC) which is operated by Battelle's Columbus Laboratories, 505 King Avenue, Columbus, Ohio 43201, under Contract DLA900-78-C-1715. The MCIC program has been administered under the direction of the Defense Logistics Agency with technical supervision by the Army Materials and Mechanics Research Center, Watertown, Massachusetts, Mr. Sam Valencia, was the Contracting Officer's Technical Representative until his retirement; Mr. Raymond Farrow is currently filling that position.

This Annual report covers the period of work May 1, 1980, through April 30, 1981. The Twelfth Quarter statistics (February 1981 through April 1981) are also included. The report was released by the authors July 1981.

The MCIC and Battelle management express their appreciation to those many sponsor representatives whose advice, guidance and support have been essential to the continuing success of the MCIC program. Particular mention should be made of the significant contributions of

Mr. Joseph Blue, DLA
Mr. J. Pendergast, DTIC
Mr. Samuel Valencia, AMMRC
Mr. Raymond Farrow, AMMRC
Ms. Frances Burke, DESC
Ms. Sara Williams, DESC
Mr. Jerome Persh, OUSRDE

ANNUAL REPORT
(May, 1980 through April, 1981)

and

Twelfth Quarterly Progress Report
(February through April, 1981)

on the

OPERATION OF THE METALS AND CERAMICS INFORMATION CENTER

to

ARMY MATERIALS AND MECHANICS RESEARCH CENTER

INTRODUCTION

In 1971, the Metals and Ceramics Information Center (MCIC) was formed through the merger of the Defense Metals Information Center (DMIC) and the Defense Ceramic Information Center (DCIC). The former had been operated by Battelle since the mid-1950s, and the latter since 1967. Thus, MCIC is continuing more than 2 decades of service to the defense materials community.

As one of the family of technical information analysis centers sponsored by the Department of Defense, MCIC's purpose is to provide an authoritative source of current engineering and scientific information and data on metal and ceramic materials and composites containing those materials which may be applicable to defense systems. Although intended primarily for service to agencies of DoD and their contractors, MCIC's resources are available to the technical community at large, thus contributing to the transfer and adaptation of defense-developed technology for commercial and consumer use.

This report summarizes MCIC activities for the period May 1, 1980, through April 30, 1981, the third 12 months under Contract DLA900-78-C-1715. It provides a summary of the scope, objectives and organization of MCIC, its information processing and services, and a discussion of future plans for the maintenance of the Center's resource of technical knowledge in metals and ceramics. Statistical summaries of expenditures for the various activities conducted in the Twelfth Quarter and the three-year contract period are given in Appendix A (DSAH Form 1261).

Two additional years of Battelle's operation of MCIC are covered under our current contract.

Scope and Purposes of MCIC

MCIC is recognized as a formal full-service Department of Defense Information Analysis Center (IAC). As such, under the contract reported on herein, its objectives have been to provide scientific and technical information analysis services to the Department of Defense components, contractors and grantees, U.S. Government agencies and their contractors, and to the private sector. The scope includes metals and ceramics in various forms (i.e., bulk, coating, etc.) which are utilized in defense systems and hardware with emphasis on critical structural applications and/or stringent environments. Since the establishment of the Metal Matrix Composites Information Analysis Center, MCIC no longer covers composites.

The Center collects and provides its users with information on the design characteristics, applications, processing, fabrication, quality control, environmental effects, test methods, sources, suppliers, and specifications for materials within its scope.

To accomplish these objectives, the MCIC program consists of five principal functions:

(1) Maintenance of a comprehensive, up-to-date, authoritative technical information base

(2) Responses to requests for technical advice and assistance from Government agencies, contractors, suppliers, and the public sector

(3) Issuance of a monthly Current Awareness Bulletin covering metals and ceramic technology on a variety of subjects

(4) Publication of technical reports, handbooks, databooks, critical reviews and technology assessments appraising the state of the art of metals, ceramics, and processes

(5) Conduct a variety of special studies for DoD agencies and other departments of the Federal government.

Organization of the MCIC Program

The Metals and Ceramics Information Center is assigned to the Materials Information Program Office of Battelle's Columbus Laboratories. The Manager of that office also serves as Director of MCIC. Members of the permanent MCIC staff are drawn from Battelle's Materials Department and Computer, Information Systems, and Education Department. That full-time staff averages 13 engineers, information specialists and secretarial assistants, who are supported by nearly 100 engineers and scientists from throughout the Columbus Laboratories, contributing on a part-time basis as needed. The fundamental strength of the MCIC program lies in this team of qualified authorities, whose experience and daily participation in advanced materials research provides the Center's users with expert technical advice and authoritative state-of-the-art publications (see Figure 1).

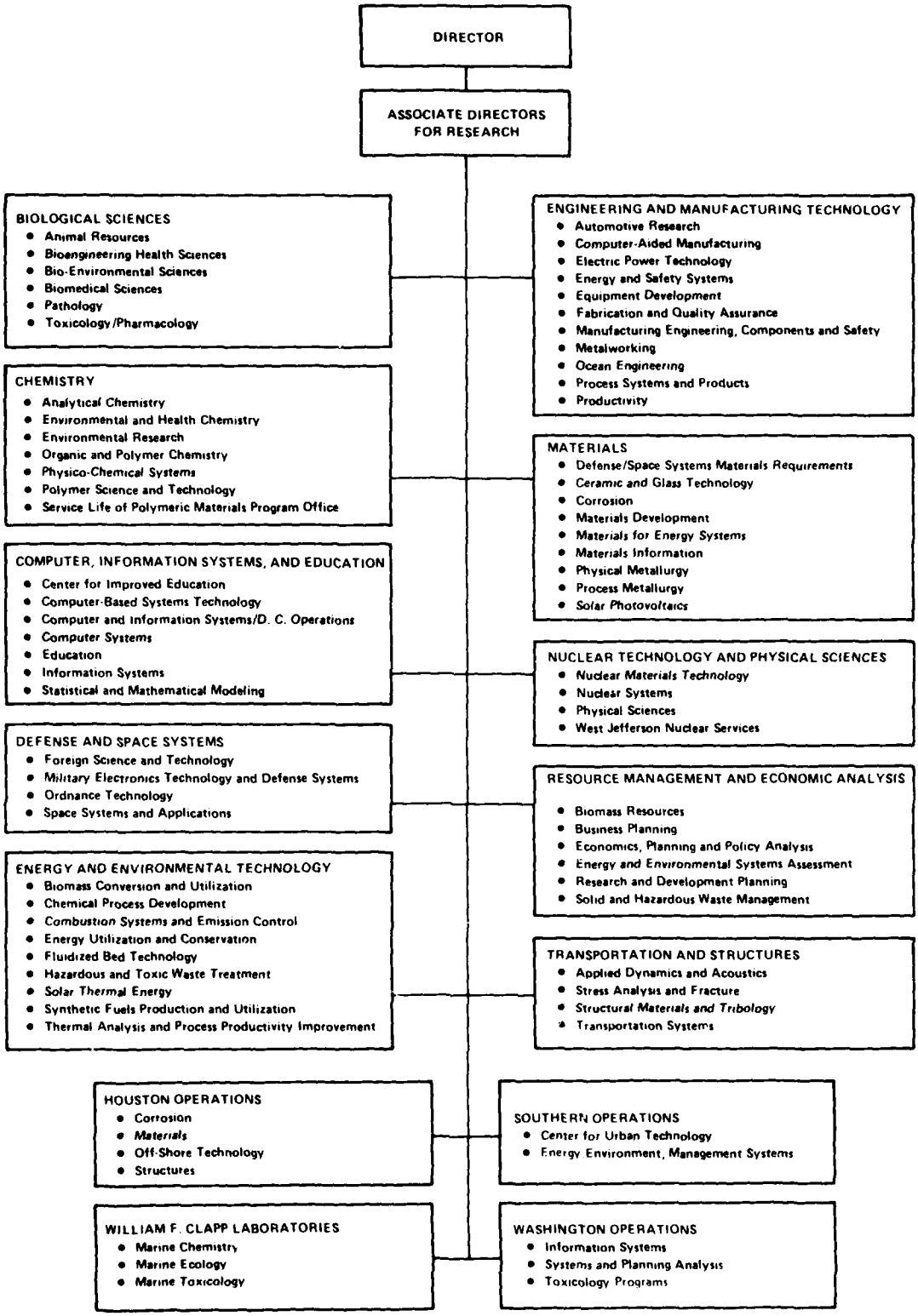

FIGURE 1. BATTELLE-COLUMBUS RESEARCH DEPARTMENTS

Battelle
Columbus Laboratories

February, 1981

Key MCIC staff assigned to manage the basic functions of the Center are:

Program Manager and Coordinator of Special Studies	Harold Mindlin
Associate Manager	James F. Lynch
Technical Inquiries and Current Awareness Bulletin	Roy W. Endebrock
Coordination of Marketing, Promotion, and Publication	Harold J. Hucek
Information Operations	Helen Pestel

INFORMATION OPERATIONS

An information base is maintained by MCIC to provide technical documentation needed by staff scientists and engineers who compile the various products of the Center and to provide a rapid, inexpensive retrieval mechanism to support the Center's technical inquiry service and special studies. The information base contains about 130,000 documents collected and reviewed since 1955 under MCIC and its two predecessors, DMIC (Defense Metals Information Center) and DCIC (Defense Ceramic Information Center).

The MCIC information base is maintained in two separate retrieval systems. The items collected prior to 1971 are maintained in a manual retrieval system utilizing extracts of documents which are filed in multiple locations by key words (index terms). The MCIC computerized file began in 1971 on the Battelle BASIS System and was moved to the Defense Technical Information Center's Defense RDT&E On-Line System (DROLS) in March 1975. The computerized file as of April 30, 1981 (Tab cycle 81-11), contains 39,606 references of which 26,398 are unique to the MCIC program, and 13,208 are DTIC holdings that were modified by enriched indexing.

Acquisition of Information

During the third year of the current MCIC contract, 4066 documents were acquired and reviewed for input into the MCIC data base. Of these, 447 documents were rejected because they were not considered relevant to the MCIC scope or because they duplicated information presently in the information base. During the Twelfth Quarter, 1031 items were acquired; 889 items were accessioned.

Table 1 indicates the percentages of the documents for the Twelfth Quarter and the yearly total which were journal articles, government reports, conference papers and miscellaneous

TABLE 1. MCIC ACQUISITIONS, MAY 1980-APRIL 1981

Document Type	Quarterly Period				Annual Total	Percent 12th Quarter	Percent Annual
	May-Jun 80	Jul-Oct 80	Nov 80-Jan 81	Feb-Apr 81*			
Journal Articles	430	465	539	269	1703	30.3	47.0
Technical Reports	440	249	345	340	1374	38.2	38.0
Air Force	123	75	133	101	432	11.4	11.9
Army	41	28	46	44	159	4.9	4.4
Navy	80	66	69	74	289	8.3	8.0
Other DoD	19	14	13	22	68	2.5	1.9
NASA	46	21	48	36	151	4.0	4.2
DOE/ERDA	42	37	29	48	156	5.4	4.3
Other	89	8	7	15	119	1.7	3.3
Technical Papers	91	96	43	268	498	30.2	13.8
Miscellaneous	21	7	4	12	44	1.3	1.2
Total	982	817	931	889	3619	100.0	100.0

*Twelfth Quarter

sources such as books, trade literature and internal papers. A breakdown of items accessioned during the ninth through the eleventh quarters of the present contract are also reported in Table 1.

Documents related to metals and metallurgy represent 86.0 percent of the annual input (84.0 percent for the Twelfth Quarter), ceramics represent 3.8 percent of the annual input (4.0 percent for the Twelfth Quarter), and composites represent 10.2 percent of the annual input (12.0 percent for the Twelfth Quarter). Of the 369 documents in the composites area, 167 were acquired to support the Carbon/Carbon Data Bank, a special project for MCIC.

Identification and acquisition of pertinent technical literature is aggressively pursued by the MCIC staff. The primary source of reports generated by DoD and other Government agencies is by direct distribution from the contractors or agencies producing the reports. Receiving reports on direct distribution avoids time delays in receipt of this information from secondary sources and allows the Center to have access to interim progress reports not distributed to secondary sources.

Pertinent reports not received on direct distribution are identified and ordered from Government abstracting services including DTIC's Technical Abstracts Bulletin (TAB), NTIS's Government Report Abstracts (GRA), NASA's Scientific and Technical Aerospace Reports (STAR), and DoE's Energy Research Abstracts (ERA).

Journal articles and technical papers are selected from a screening of all materials entering the Battelle Library on a daily basis. This source is supplemented by subscribing to key journals and ordering of individual technical papers by MCIC.

One to two percent of the Center's acquisitions are from sources such as books, trade literature, and trip reports and memoranda on MCIC staff activities which contain technical data.

RDT&E Input

A total of 2849 of the 3619 documents accessioned this contract year were processed into MCIC's dedicated data base at DTIC (DROLS). The remaining 770 documents were already in the DTIC collection. The DTIC records for these reports were supplemented with the MCIC accession numbers and enriched indexing. Twelfth Quarter statistics for DROLS input are: 682 items added to the MCIC series, 207 DTIC records augmented with MCIC numbers and enriched indexing.

On-Line Usage of the MCIC Data Base

On January 16, 1980, the MCIC data base became available to all sites having dedicated on-line terminals to the DROLS. In mid-October, 1980, the data base became available to dial-up subscribers of DROLS. Surprisingly few problems regarding the use of our data base have been brought to the attention of the MCIC staff since the addition of both user groups.

Table 2 summarizes the use of the data base by type of organization for all records displayed or ordered from the dedicated or dial-up sites for the Ninth, Tenth and Twelfth Quarters. Due to a software problem the statistics for the Eleventh Quarter are incomplete and thus are excluded from Table 2. The large increase between the Tenth and Twelfth Quarters in both the average number of sites using the MCIC data base and the number of records retrieved is credited to the addition of dial-up users in the Eleventh Quarter.

TECHNICAL REPORTS AND HANDBOOKS

Information transfer on advances in materials technology within MCIC's scope and related to applications in defense systems and hardware is an important activity of this program. In response to needs of Government, particularly DoD, as well as industrial and academic communities, a variety of publications is prepared by the Center. The archival documents include handbooks/databooks and technical reports which are represented in state-of-the-art reports, proceedings of conferences, critical reviews or technology assessments, as well as comprehensive listings of available literature as related to identifiable areas of interest.

No technical reports or handbooks/databooks were initiated or published in the Twelfth Quarterly period. However, processing was continued on eight publications.

A status summary of the Center's publications activity during the past year (May, 1980–April, 1981) is given in Table 3. In this annual period one handbook was published and four databook compilations and four technical reports were in process. Of these, two databook volumes and three technical reports were initiated during the report year. Also, three reports are in the proposal or negotiation stage and may be started later in 1981.

As shown in Table 3, two databooks are in final publications stages (one is at the COTR for review and one is at the printers) and may be available during the next quarter. Also, two reports are in the final publication stages and should be available next quarter. (Because of the sensitivity of the technical area on rapid solidification, one of these reports will require special review and approval prior to release.)

The "Advanced Composites Design Guide" will be handled by the U.S. Air Force; hence, MCIC will not be involved in its publication.

A listing of Battelle personnel who contributed to these publications is given in Appendix D.

User Feedback

An effort to determine user satisfaction with MCIC's publications has been ongoing since September, 1977 in accordance with contract requirements. The MCIC user evaluation form, shown in previous annual reports, is a modified and approved version of the DLA suggested form. It is included in technical reports and handbooks purchased from MCIC and includes a

TABLE 2. STATISTICS ON THE USE OF THE MCIC DATA BASE VIA DROLS FOR NINTH, TENTH AND TWELFTH QUARTERS*

Class of Users	Ninth Quarter		Tenth Quarter		Twelfth Quarter						12th Quarterly Totals	
					Feb. 1-28		Mar. 1-31		Apr. 1-30			
	Avg. No. of Sites	Records Retrieved	Avg. No. of Sites	Records Retrieved	No. of Sites	Records Retrieved	No. of Sites	Records Retrieved	No. of Sites	Records Retrieved	Avg. No. of Sites	Records Retrieved
Air Force	8.3	148	10.0	228	8	125	12	66	8	57	9.3	248
Army	14.0	629	17.0	429	20	166	18	173	22	438	20	777
Navy	13	453	10.7	590	12	145	12	112	11	46	11.7	303
Other Government	5.0	106	5.0	156	4	60	8	87	7	128	6.3	275
Industrial	11.7	397	12	351	24	197	28	1230	32	497	28.0	1924
DTIC	3.7	578	4.3	760	5	280	3	245	4	297	4.0	822
Other IACS	3.3	268	2.0	701	2	50	3	96	3	124	2.7	270
Total Other	59	2579	61	3215	75	1023	84	2009	87	1587	82	4619
MCIC	1	3055	1	2432	1	1765	1	1570	1	823	1	4158
Total	60	5634	62	5647	76	2788	85	3579	88	2410	83	8777

*As measured by the records displayed by users with both on-line displays and orders. Eleventh quarter statistics received from DTIC were incomplete and are thus excluded.

TABLE 3. STATUS OF MCIC TECHNICAL PUBLICATIONS (APRIL 30, 1981)

Publications	Activity Status[1]	*Estimated* Cost to Complete, $	Publication Date Previous	Publication Date Revised	Remarks
Handbooks/Data Books					
Published					
Soviet Alloys Handbook HB-05 Revised Edition		—	—	—	Published, December 1980
In Process					
Engineering Property Data on Selected Ceramics, Vol. III, *Single Oxides*, HB-07V3	TR	5,000	—	6/81	COTR review
International Alloy Compositions, Volume III, Aluminum, HB-09V3	P	16,000	—	4/81	At printer, available May 1981
Advanced Composites Design Guide	—	—	—	—	Air Force Flight Dynamics Laboratory will distribute the handbook under their supervision. MCIC will not publish.
International Alloy Compositions, and Designations, Volume IV, Copper, HB-09V4	TP	36,000	4/82	—	Feasibility being evaluated
Technical Reports					
In Process					
Near-net Shaping of Ceramics	TP	—	—	—	Publication uncertain. Disposition being determined.
Corrosion Fatigue in Marine Environments	TR	10,000	5/81	7/81	[2]
Special Welding Technology	TP	19,500	6/81	8/81	[2] Author illness caused delay
Rapid Solidification of Metals	TR	14,000	4/81	—	Draft completed; final corrections for DoD review
Proposed					
Isothermal, Precision Forging	—	(30,000)	—	—	—
Surface Analysis of Thin Protective Films on High-Performance Alloys	—	(45,000)	—	—	—
Revision and Update of Hot Isostatic Processing.	—	(45,000)	—	—	—

(1) *Legend: TP—technical preparation, TR—technical review, E—editing, P—publication, N—negotiation to publish.*

(2) Delay caused by larger than expected amount of data to be analyzed for the databook/report or extensive technical editorial changes.

business return address to MCIC. All original forms received by MCIC are copied and forwarded to DLA. Although this is a reversal of procedure suggested by DLA, it provides MCIC with a more rapid insight of user responses.

During this annual period 26 evaluation forms for 7 handbooks, 19 reports and the CAB were received. The returns represent about 1.5 percent of the number of documents sold directly by MCIC. All returns indicated satisfaction with MCIC publications.

Analysis of the forms showed that the use rate varied from three times per year to three times per week with the average at about 50 times per year. The savings realized from use of the publications ranged from $500 per year to over $10,000 with the average savings calculated to be about $4,000 per year. The use of the publications on projects varied from two to greater than ten (most people check the two-five projects box). The comment from many users was a request for more detail which appears to be a particular individual's need and not amenable in the overall compilation of the document.

In general, this limited evaluation of MCIC reports, handbooks, and databooks indicates that a publication is useful to four projects/tasks about 50 times per year (once per week) and saves the user about $4000 per year. Conservatively, the evaluation means that the 1993 MCIC publications sold in the U.S. during the past year were used 60,000 times and saved the Government $8 million on projects/tasks. Thus, the Department of Defense has realized a return on investment of about 11 to 1 for MCIC on publications alone.

Sales

Although sales of publications have decreased significantly during this contract year, the publication of several new titles within the May to July, 1981, period should be reflected in a marked increase in sales activities during the next year.

CURRENT AWARENESS BULLETIN

The MCIC Current Awarencess Bulletin (CAB) is designed to fulfill the current awareness commitment required by the MCIC contract to periodically alert its users to important technical developments within the Center's materials, properties, and processes scope. Various Battelle Columbus Laboratory scientists and engineers with special expertise in the materials field present highlights of selected current MCIC acquisitions. The CAB format may include the following material categories, as well as, a special news section which features various items of interest to users.

METALS
- Light Metals
- *Rapidly Solidified Alloys*
- Steels
- Stainless Steels
- Superalloys
- Refractory Metals
- Metals Fabrication (Metalworking, Joining)
- Testing-Method Evaluation

CORROSION/COMPATIBILITY

CERAMICS
- Structural
- *Refractory*
- Special Glasses
- Electronic
- Carbon-Graphite

MCIC NEWS
- Meetings/Symposia
- Call for Papers
- Recent Reports and Books
- R&D Contracts

Frequency of the CAB publication was changed from two to one issue per month as of November 1980 (Issue No. 93). In addition, a feature article for each issue was initiated to cover technical meetings or technical areas of particular interest to the DoD materials community.

The CAB is disseminated without-charge only to U.S.-based users of the Center upon written request. Updating of the distribution list is a continuous process based on (1) direct request for cancellation, address change or placement on list and (2) undelivered mail. The distribution list has about 3575 subscribers, as of April 30, 1981.

Publication statistics for the 18 CAB's published during this annual reporting period (including the Twelfth Quarter) are given in Table 4. These 18 issues represent a total of 173 pages (which include NEWS section), 315 digest of technical accessions, and 5 lead articles or meeting reports.

In addition to CAB, a quarterly periodical co-sponsored by the Metals and Ceramics Information Center (MCIC) and the Metal Properties Council (MPC) has been published and distributed free-of-charge to MCIC users for many years. Entitled "MCIC/MPC Review of the Low-Temperature Properties of Metals", it is authored by Mr. J. E. Campbell, an MCIC consultant and former Battelle staff member. The title is descriptive of the scope of materials accessions covered in this quarterly. During this reporting period, four publications were issued and distributed; 30 references on the subject were reviewed.

The Battelle personnel who contributed to the CAB publications in the Twelfth Quarter are listed in Appendix D; contributors to previous issues are listed in previous quarterly reports.

INQUIRY SERVICES

Technical Inquiries

MCIC provides a rapid-response technical-inquiry service primarily designed for the use of the DoD community. This service, which distinguishes MCIC as an Information Analysis Center, is facilitated through the availability of skilled scientists and specialists of the Battelle

TABLE 4. PUBLICATION STATISTICS OF THE CURRENT AWARENESS BULLETIN (CAB) FOR THE PERIOD, MAY 1980-APRIL 1981

	Issue			Number of References Cited				
Quarter	No.	Date	No. of Pages	Metals	Ceramics	Composites	Corrosion	Total
9	81	5-9-80	8	12	2	—	4	18
	82	5-23-80	12	14	1	2	5	22
	83	6-6-80	8	12	2	1	4	19
	84	6-20-80	8	11	—	—	5	16
	85	7-11-80	12	15	2	—	5	22
	86	7-25-80	8	10	—	—	4	14
		TOTAL	56	74	7		27	111
10	87	8-8-80	11	10	3	—	5	18
	88	8-22-80	8	11	—	—	6	17
	89	9-5-80	11	15	—	—	4	19
	90	9-19-80	8	13	—	—	4	17
	91	10-10-80	8	10	—	—	5	15
	92	10-24-80	8	10	2	—	5	17
		TOTAL	54	69	5	0	29	103
Change to Monthly Publication								
11	93	11-7-80	12	17	2	—	3	22
	94	12-19-80	8	9	—	—	—	9
	95	1-28-81	8	9	2	—	—	11
		TOTAL	28	35	4	0	3	42
12	96	2-27-81	11	13	1	—	—	14
	97	3-27-81	12	15	3	—	—	18
	98	4-24-81	12	16	—	—	11	27
		TOTAL	35	44	4	0	11	59
		GRAND TOTAL	173	222	20	3	70	315
		(PERCENT)		(70.5)	(6.3)	(1.0)	(22.2)	

Columbus Laboratories. Consequently, answers are provided with appropriate depth, as required, by placing the inquirer in direct contact with a technical authority for the expeditious resolution of materials problems. Answers are executed through telephone discussions, on-line computer printouts, letter reports, on-site visits, and through MCIC-published reports and handbooks.

Statistics for the technical inquiries processed during the 12-month period (May 1980-April 1981) are summarized in Table 5. Classification of these technical inquiries is provided in Table 6. Statistics for the Twelfth Quarter are included in both tables.

During this annual report period, MCIC received 389 requests for technical assistance of which 269 (69.2 percent) were processed and 120 were cancelled. In the three preceding annual report periods (AMMRC-TR-80-33/July 1980, AMMRC-TR-79-43/July 1979, and AMMRC-TR-78-43/July 1978), the percentages of processed inquiries were 76.7, 84.8, and 78.5 percent, respectively. We believe the down turn in effective rate is a continuing illustration of the difficulties experienced by potential MCIC users in both industry and the Services to expedite charges for technical information from information analysis centers.

Of the completed inquiries, 56 were subject to a user charge, and 213 were answered without charge. *One should be aware that many of the 269 technical inquiries were complex and multifaceted, although counted statistically as a single inquiry.* Ordinarily, each of the no-charge inquiries represented a minimal effort by an MCIC staff member or a Battelle staff person, requiring an hour or less of effort to provide a satisfactory answer. On the other hand, cancelled inquiries often require more MCIC effort in addition to the technical effort required to provide a cost estimate. Note that a cancelled inquiry is defined as one that has been priced (sometimes even processed during the cursory evaluation), but not completed because final authorization to proceed was never received by MCIC.

Single inquiry charges for the 56 service-charge inquiries ranged from $10 to $2400 and represent a total income of $10,771. The 213 no-charge inquiries, credited at $50 per inquiry, represent a cost of $10,650; the 120 cancelled inquiries, also credited at $50 per inquiry, represent a cost of $6,000.

Listings of the specific requestors for whom assistance was provided and the Battelle-Columbus personnel who were directly involved in technical-inquiry services during the Twelfth Quarter are given in the Appendices B and D, respectively, in this report. Inquiry listings and personnel involved in inquiry services for the other quarterly periods are given only in appendix sections of previous quarterly reports.

Nontechnical Inquiries

Significant effort also is expended in answering a variety of queries unrelated to MCIC's technical scope. A statistical summary of the number of inquiry responses to the sectors of the user audience is given in Table 7.

TABLE 5. TECHNICAL INQUIRY STATISTICS FOR THE PERIOD, MAY 1980-APRIL 1981

	Number of Inquiries per Quarter												Annual Total	
	Ninth			Tenth			Eleventh			Twelfth				
	SC	NC	Total	SC	NC	Total	SC	NC	Total	SC	NC	Total	No.	(Percent)
Category														
Industrial	18	45	63	10	44	54	11	43	54	12	40	52	223	(82.9)
Government	—	9	9	2	5	7	1	2	3	1	6	7	26	(9.7)
Academic	1	4	5	—	4	4	—	5	5	—	—	—	14	(5.2)
Foreign	—	1	1	—	1	1	—	1	1	—	3	3	6	(2.2)
Totals, No.	19	59	78	12	54	66	12	51	63	13	49	62	269	
Quarterly, %	24.4	75.6		18.2	81.8		19.0	81.0		21.0	79.0			
On Annual Basis, %	7.1	21.9	29.0	4.4	20.1	24.5	4.4	19.0	23.4	4.8	18.2	23.0		(100.0)
SC[a] Income, $10,771	$1475			$1415			$4175			$3706				
NC[b] Credit, $10,650		$2950			$2700			$2550			$2450			
Cancelled[c] Inquiries Credit, $6,000		$1400(28)			$1850(37)			$1600(32)			$1150(23)		(120)	
Quarter Subtotals, $27,421			$5825			$5965			$8325			$7306		
Type of Response														
Technical (non-biblio)	4	52	56	4	50	54	4	47	51	4	45	49	210	(78.1)
Bibliographic	15	7	22	8	4	12	8	4	12	9	4	13	59	(21.9)
Quarter Totals	19	59	78	12	54	66	12	51	63	13	49	62	269	
SC Bibliograpic Inquiries													40	
NC Bibliographic Inquiries													19	

(a) SC — Service Charge.
(b) NC — No Charge.
(c) Number in parentheses indicates number of inquiries.

TABLE 6. CLASSIFICATION OF TECHNICAL INQUIRIES PROCESSED BY MCIC DURING THE PERIOD, MAY 1980-APRIL 1981

Classification	Number of Inquiries per Quarter								Annual Total	
	Ninth		Tenth		Eleventh		Twelfth			
	No.	Percent	No.	Percent	No.	Percent	No.	Percent	No.	Percent
Materials										
Metals	70	89.7	62	93.9	61	96.8	60	96.8	253	94.0
Ceramics	6	7.7	1	1.5	2	3.2	2	3.2	11	4.1
Composites	2	2.6	3	4.6	—	—	—	—	5	1.9
Totals	78	100.0	66	100.0	63	100.0	62	100.0	269	100.0
Technical Scope										
Properties	29	37.2	29	44.0	23	36.5	26	42.0	107	39.8
Processing	18	23.1	14	21.2	21	33.3	21	33.9	74	27.5
Corrosion	10	12.8	4	6.1	4	6.4	5	8.1	23	8.6
Applications	9	11.5	5	7.6	4	6.4	2	3.2	20	7.4
Markets	6	7.7	3	4.5	2	3.2	1	1.6	12	4.5
Foreign Equivalents	4	5.1	5	7.6	—	—	3	4.8	12	4.5
Fundamental Behavior	1	1.3	3	4.5	4	6.4	1	1.6	9	3.3
Specifications	—	—	1	1.5	2	3.1	3	4.8	6	2.2
Test Methods	1	1.3	2	3.0	3	4.7	—	—	6	2.2

TABLE 7. NONTECHNICAL INQUIRY RESPONSES

User Audience	Approximate Nontechnical Inquiries Per Quarter				Total	
	9	10	11	12	No.	Percent
Government	32	32	23	13	100	11.0
Industrial	193	174	121	116	604	66.5
Academic	12	24	10	22	68	7.5
Foreign	66	15	23	32	136	15.0
				Total	908	

In the annual report period approximately 908 nontechnical inquiries were answered by MCIC management and supporting staff. Of these inquiries, 604 were industrial, 100 Government, and 68 academic, and 136 foreign. Typical inquiries represent questions related to:

- Products and services of the Center
- Quotations on MCIC products/services
- Orders for MCIC reports/handbooks
- Information on CAB and its availability
- Request for TML, DMIC, and DCIC reports
- Identification and source of Government reports
- Requests for reference cited in publications
- Source for acquisition of journal articles
- Source(s) of technical information not in MCIC scope.

SPECIAL STUDIES/TASKS

This category covers tasks which can be described as "super" inquiries. The tasks, under separate funding by agencies of DoD through supplements to the basic MCIC contract, generally require a substantial amount of technical effort extending over a period of time. Each inquiry can involve one or more phases of study which are assigned to various research staff within Battelle. These tasks are monitored by MCIC whose combination of information and data resources and professional skills in pertinent fields often make it possible to save both time and costs in completing each effort. Through such assignments, the Government is able to capitalize further on the substantial investment it has made in the creation of the technical information services.

Table 8 presents a summary of the Special Studies which were active during this contract period. Task progress for the Twelfth Quarter can be summarized as follows: new (1), completed (2), continuing (3), additional funding (0).

It is important to note that two Special Studies have been continued since the inception of the current MCIC contract. These are

- Establishment and Operation of a Carbon/Carbon Composites Materials Data Base (U.S. Air Force and Navy Sponsorship)
- Preparation of Journal for Army Manufacturing Technology Data Base (U.S. Army/ AMMRC)

Both of the programs have been well received by the technical community.

TABLE 8. SUMMARY OF SPECIAL STUDIES

Title or Description	Modification	Funding Level	Sponsoring Agency	Period of Performance
Carbon/Carbon Composites Materials Evaluate Data	P00002	$ 35,000	Air Force/RPL	1 May 1978 - 31 Oct 1978
Establishment and Operation of Data Base	P00011	50,000	Air Force/AFML	5 Jan 1979 - (Continuing)
	P00012	80,000	Navy/NAVSEA	
	P00022	50,000	Air Force/RPL	
	P00022	55,000	Air Force/AFML	
	P00025	65,000	Navy/NAVSEA	
	P00030	110,000	Air Force/AFFTC/PKA: Navy/NAVSEA	
	—	100[2]		
	—	659[3]		
Manufacturing Technology Plan	P00003/4	85,000	Navy/NAEC	Completed Sept 1979
	P00006	85,000	Navy/NASC	
Silcon Nitride Properties	P00001	6,000	AMMRC	Completed Dec 1978
Technical Assistance in Establishment of Army Battlefield Systems Integration, Base Terminology Data Base	P00001	74,976	AMMRC	Completed Apr 1980
	P00013	3,024		
	P00017	28,750		
	P00021	50,000		
Preparation of Journal for Army Manufacturing Technology	P00005	34,370	AMMRC	4 Aug 1978 - (Continuing)
	P00009	95,346		
	P00015	11,246		
	P00018	127,000		
	P00021	22,500		
	P00030	153,385		
		14,064[2]		
		4,760[3]		
MTAG Support	P00028	28,773	AMMRC	Completed Jan 1981
	P00030	14,529		
		4,000[4]		
Publication of Proceedings of Tri-Service Corrosion Conference	P00008	7,855	AMMRC	Completed June 1979
		7,000	ARRADCOM	
Technical Advisory Services for AMMRC and OUSDRE	P00005	8,500	AMMRC	Completed Apr 1979
Ship Structural Research and Development Requirements	P00007	20,000	Navy/NSRDC	Completed June 1979
Fourth Conference on Fibrous Composite in Structural Design	P00010	6,975	AMMRC	Completed Mar 1981
	—	18,602[5]		
Third Army Materials Technology Conference on Ceramics for High-Performance Applications	P00013	24,985	AMMRC	2 Mar 1979 - 31 Mar 1982
		16,646[5]		
Crack Arrest Development Plan	P00019	20,000	Navy/NSRDC	Completed Oct 1980

TABLE 8. SUMMARY OF SPECIAL STUDIES (Continued)

Title or Description	Modification	Funding Level	Sponsoring Agency	Period of Performance
CAD/CAM Technology Transfer (Phase I)	P00021	8,900	AMMRC	Completed Apr 1980
DoD Mat'ls/Struct. Tech. Conf.	P00027	20,000	AFWAL	Completed Apr 1981
	P00028	20,000	Navy/NAVSEA	
	P00030	20,000	AMMRC	
Welding Procedures for Marine Propellors	P00031	40,000(1)	Navy/NAVSEA	1 Feb 1981 - 31 July 1981

(1) Funded in Twelfth Quarter
(2) Income previous 11 quarters
(3) Income for Twelfth Quarter. Journal income includes 1980 subscriptions
(4) Net from registration fees (after payment of MTAG Conference Expenses)
(5) Conference Registration Fees—required to cover conference expenses, publication of proceedings for authors and all attendees.

MARKETING AND PROMOTION

In accordance with DoD policy, a service charge program was initiated in 1972. Since that time 73 technical documents (not including CAB) have been generated and 67 are still being sold through MCIC's marketing program. At the present time marketing is being conducted by five outlets in addition to MCIC. Those agencies which have a formal marketing agreement with MCIC include:

NTIS (worldwide)

American Society for Metals (U.S. only)

Metal Powder Industrial Federation (U.S. only)

Neutrino/MRI (Japan)

Allied Publishers Private, Ltd. (India).

In this annual period (May 1980–April 1981), 2317 documents were sold for a gross income to MCIC of $75,558. The documents included 1162 technical reports ($24,473), 964 handbooks/databooks ($42,263), and 191 special documents ($8,822). Statistics are given in Appendix Tables C-1, C-2 and C-3, respectively.

During the Twelfth Quarterly period, 498 documents were sold for a gross income to MCIC of $16,950; included were 214 technical reports ($4,679), 241 handbooks/databooks ($10,141), and 43 special documents ($2,130). Details on these statistics are given in Appendix Tables C-4, C-5 and C-6, respectively.

The rental or sale of the MCIC films entitled, "Scanning Fractures with the Electron Microscope", and "Ceramics and Metals in Medical Prosthetics" provided a gross income for the past year of only $60 of which $20 was received in the Twelfth Quarterly period. No new MCIC films are planned for the future.

Experience has shown that the sale of MCIC's products and services requires an aggressive promotion effort. Consequently, MCIC has maintained a modest program within the limitations of resources available. The promotional efforts conducted during the Twelfth Quarter are summarized in Table 9. Promotional activities of the previous report periods are given in the prior quarterly reports in this annual period.

In general, the promotional program conducted during the past year has resulted in an actual income to MCIC of $75,558 which is a 39.6 percent decrease over the 1980 sales income ($125,117). The decrease in sales income is probably due to the fact that no new MCIC titles were published rather than the ineffectiveness of the promotional program. Therefore, the promotional program will continue with special mailings, inserts in technical journals as book reviews, and special announcements in pertinent trade literature.

TABLE 9. PROMOTION EFFORTS OF MCIC PUBLICATIONS (TWELFTH QUARTER)

Report No.	Short Title	Type of Promotion	Publication/Audience
HB-09V2	International Alloys—Titanium	Book Review	"Titanium '80," Proceedings of the Fourth International Conference on Titanium, AIME, Kyoto, Japan, May 19-22, 1980
All MCIC Publications	Materials Information Publications (MIP) Brochure	Special Mailing	Mailed to the Machinability Data Center List, approximately 17,500 on Feburary 17, 1981
All MCIC Publications	MIP Brochure	CAB Inset	Mailed with the MCIC Current Awareness Bulletin (CAB) approximately 4,000 on February 27, 1981
All MCIC Publications Including the Army ManTech Journal	MIP Brochure	Meeting Display and Handout	WESTEC, ASM/SME Conference in Los Angeles, March 23-26, 1981, 50,000 attendees expected
All MCIC Publications	MIP Brochure	Special Mailing	Sent to MCIC purchasers list (1731), March 25, 1981

Meetings Attended

In support of MCIC's program management, operation, and technical activities, personnel of both the Center and Battelle's Columbus Laboratories attended 30 meetings during this annual report period. The following meetings were attended in the Twelfth Quarter, meetings attended during the Ninth through Eleventh Quarters were given in the respective quarterly reports.

Personnel	Meeting	Location	Date
H. Mindlin	Discuss Information Analysis Center activities	Aluminum Association Washington, D.C.	March 1981
	Discuss Information Center Activities	American Society for Testing & Materials Philadelphia, PA	March 1981
	Discuss MCIC Activities	AMMRC	March 1981
H. Mindlin D. Spalsbury	ManTech Advisory Meeting	Battelle	April 1981
D. Spalsbury	ManTech Information	AVRADCOM, St. Louis	February 1981
	ManTech Information	TACOM, Warren, MI	March 1981
	ManTech Information	AMMRC and Natick Labs, Boston, MA	April 1981
	ManTech Information	MICOM, Huntsville, ALA	April 1981
H. Pestel	Resource Sharing Advisory Group of DTIC	Belleville, IL	March 1981
	ASM Metals Information Committee	Cleveland, OH	April 1981
C. Green	RDT&E On-Line System (DROLS) Southern Regional Users Conference	Orlando, FL	April 1981

Visitors

The following government, industry, and foreign representatives visited MCIC during the annual period covered by this report. Several of the visits were related to special tasks; others were related to specific MCIC operations or for overviews of this program.

Name/Area of Interest	Company/Organization
V. Eastwood/Aluminum Cross Index	Aluminum Assoc./Consultant
A. K. El-Duweini/MCIC	Egypt, National Information & Documentation Center
Akira Ohmi/MCIC	Nippon Steel/Japan
K. Kaye/MCIC	Westinghouse Electric Corporation
J. Pendergast/Project Review	DLA
S. Valencia/Project Review	AMMRC
V. Koval/MCIC and MPDC	Russia
Tsuneo Owada/Discuss sale of MCIC publications	Neutrino/Japan
Mrs. Effat El-Shooky/Infomation Centers activities	Egypt
Dr. J. Nitsche/Publications	West Germany
Dr. J. F. Jamet, Dr. D. Broussaud/MCIC Operations	Onera Chatillon/France
Mark E. McCann/MCIC	Fansteel Metals/Elyria, Ohio
Koji Kokubo/MCIC	Technical Research Institute/Japan
Virginia Voedisch, Barbara Layne, Dr. A. Friedberg/MCIC Operations	American Ceramic Society

INCOME AND COST RECOVERY

Charges for MCIC's products and services have been in effect since January 1972. The objective of the service-charge program is to recover part, or all, of the costs associated with the output of the Center. The income is intended to offset many costs and to provide for expansion of services to the technical community.

The income achieved by MCIC in the Twelfth Quarter as well as the total income for the annual period May 1980 through April 1981 was $67,907 and $573,833 respectively. A breakout for the income is shown in Table 10. A three-year summary of the direct income from the sales of publications (Handbooks, State-of-the-Art Reports), paid inquiries, and miscellaneous, (film, report duplication, etc.) is presented in Figure 2. This figure covers income of $301,153 (including $22,586 from NTIS).

The total income ($573,833) for the annual period represents 76 percent of the basic funding ($755,000). In general, the overall income of the period of the program exceeds the contractual goal for the service-charge requirement.

Specifically, the amount of direct income ($565,565) and the amount of indirect income ($8,268) represents a cost recovery of 98.6 percent and 1.4 percent, respectively, based on

TABLE 10. MCIC INCOME SUMMARY

Products/Services	Income, $* 12th Quarter	Annual Total[a]
Direct[b]		
Publications:		
Reports	5,836[c]	24,558
Handbooks	10,796[c]	42,263
Films	20	60
Inquiry Services	2,284[d]	7,889[j]
Special Studies/Tasks	45,419	481,973
Miscellaneous	2,130[e]	8,822
Subtotal	66,485	565,565
Indirect[f]		
Technical Assistance Contracts	982[g]	1,388[j]
Other Contracted Activities[h]	—	5,200
In-House Inquiry Services	440[i]	1,680[j]
Subtotal	1,422	8,268
TOTAL	$67,907	$573,833

(a) May 1980–April 1981.
(b) Obtained from (1) sale of publications and services; income returned directly to the contract and (2) studies/tasks as supplements to the MCIC contract.
(c) Includes 11th quarter sales through NTIS.
(d) Four inquiries, Nos. 1988, 2002, 2008, and 2009 billed by MCIC or NTIS.
(e) Supplemental income from special products listed in Appendix C.
(f) Constitutes (1) separately contracted studies for either government or industrial sponsors and (2) costs of services provided to in-house programs; see Appendix B for identification.
(g) Service contract with Aerospace Corporation, Inquiry No. 1989; AMMRC, Inquiry No. 1986.
(h) Contract with Metals Properties Council for quarterly reviews on "Low-Temperature Properties of Metals", 1981.
(i) In-house inquiries, Nos. 1975, 1980, 1990, 1991, 1996, 2026, and 2032.
(j) Technical inquiry income reported in Appendix A.
* Total billing for periods indicated. Actual incomes received for publications and inquiry service in the 12th Quarter and Third Annual periods were $22,315 and $93,409, respectively. Included are $11,061 received from NTIS.

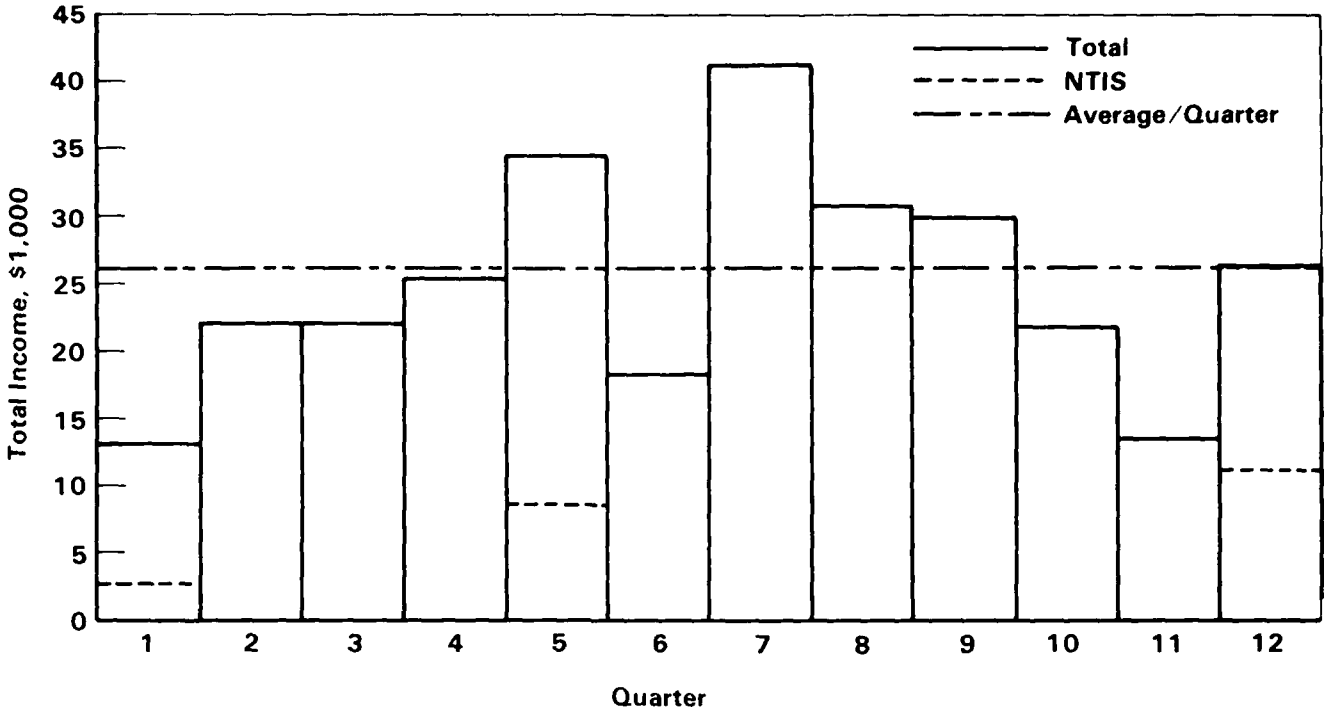

FIGURE 2. SUMMARY OF DIRECT INCOME FROM SALES OF PUBLICATIONS AND INQUIRIES

total income. Activities related to MCIC publications, i.e., reports, handbooks, films, and inquiry services, were responsible for 14.8 percent of the direct income, whereas, the special studies/tasks and associated product sales income accounted for 85.2 percent of the total direct income.

Mailings

Payment of postage costs for MCIC mailings was effective May 1978 per instructions from the Defense Logistics Agency. During the Twelfth Quarter, 31,879 pieces of mail were processed through the mail facility of Battelle's Columbus Laboratories at a cost of $3,889.50; the mailings included 1037 at 1st Class rate, 29,330 at Bulk rate, and 1,512 at Air Parcel Post or 4th Class Book rate. The bulk rate mailing was for the Current Awareness Bulletin.

A detailed accounting of the postage activity and costs for the annual period (May 1980–April 1981) is given in Table 11. A total of 82,104 pieces of mail was processed at a mailing cost of $9,535.21.

TABLE 11. ANNUAL POSTAGE STATISTICS (MAY 1980-APRIL 1981)

MCIC Operation	Number of Pieces			Cost, $
	1st Class	Book Rate[a]	Bulk Mail	
Info Input	642	1	—	51.37
Technical Inquiries	130	—	—	83.98
CAB	4	—	56,318	2,067.28
ManTech Journal	583	1,941	—	2,872.42
Marketing & Promotion	664	769	19,231	2,920.59
Administration	623	272	—	214.99
Special Studies/Tasks	407	290	229	1,324.58
Totals	3,053	3,273	75,778	$9,535.21

(a) Fourth Class.

Future Planning

The basic operational procedures that have been developed by Battelle through its operation of the Metals and Ceramics Information Center have permitted the effective continuation of the key functions of this Center. Pertinent and timely services to the Department of Defense and its technical community have been and will be continued within the time and resources available for MCIC's operation.

The current problems of rising costs has had its effect upon the overall operation of this Center. To put that problem into perspective, a five-year summary of the financial operations of MCIC is presented in Figure 3. The average cost of a person hour of effort (which reflects all MCIC costs) to maintain MCIC has risen approximately 41 percent since 1976; also, this rise in cost is reflected in the reduction of the level of effort by about 1700 hours per year.

This lack of resources has been reflected in the delay in completing several ongoing tasks:

1. Screening of older information resources for the better utilization of storage space
2. Upgrading of retrieval vocabulary for control and implementation of MCIC's storage and retrieval systems
3. Expand the technical coverage of our products and services
4. Undertake an expanded Promotion and Marketing effort.

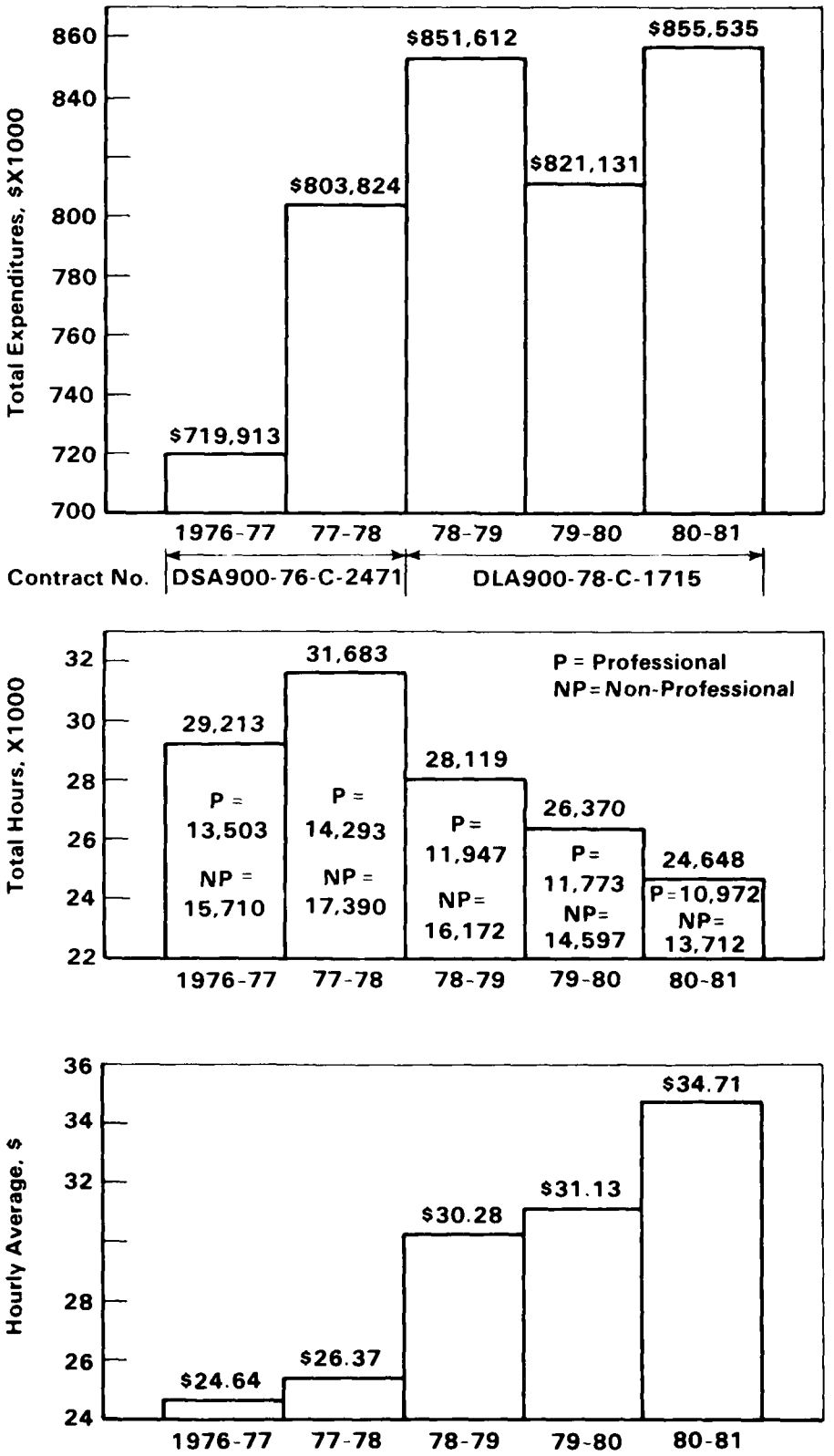

FIGURE 3. FIVE-YEAR FINANCIAL SUMMARY OF MCIC FINANCIAL OPERATION

Adjustments in program activities and operational staff will be continued. Continuing efforts are being made to procure additional funds from the expansion in sales of products and services. Although we have maintained a high cost recovery through special studies and tasks, funding for the basic contract operations through these services has not been significant. The staff has been reduced (as seen in Figure 3) to a point that coverage in some areas has been minimized (e.g., metal matrix composites prior to October 1980).

Future planning will continue to incorporate regular review of MCIC operation to assure the cost-effective utilization of contract funds to attain MCIC's goals. Any major change in the current operations will require a reassessment of MCIC scope or additional funding.

APPENDIX A

CONTRACT STATUS REPORTS

APPENDIX A

CONTRACT STATUS REPORTS

TABLE A-1. FINANCIAL STATISTICS (TWELFTH QUARTER)

INFORMATION ANALYSIS CENTER CONTRACT STATUS REPORT	NAME OF INFORMATION ANALYSIS CENTER: Metals & Ceramics Information Center					QUARTER ENDING: April 30, 1981		CUMULATIVE THRU
AREA TITLE	OUTPUT UNITS PRODUCED	MANHOURS EXPENDED			COSTS INCURRED			INCOME (d)
		PROFESSIONAL (a)	NON-PROFESSIONAL (a)	TOTAL	DIRECT (b)	INDIRECT (c)	TOTAL	
1. ACQUISITION AND INPUT OF SOURCE INFORMATION		877	1,296	2,173	24,524	35,995	60,519	
a. DOCUMENTS ACQUIRED	1,031							
b. DOCUMENTS REVIEWED	1,031							
c. DOCUMENTS CATALOGED	889							
2. TECHNICAL INQUIRY RESPONSES PROVIDED (e)	49	315	144	459	7,599	11,152	18,751	3,706 (m)
3 BIBLIOGRAPHIC INQUIRY RESPONSES PROVIDED (e)	13	—	—	—	—	—	(n)	—
4. HANDBOOKS/DATA BOOKS COMPLETED (f)		363	588	951	3,121	22,340	25,461	
a. NEW CHAPTERS/PAGES COMPLETED	—							
b. REVISED CHAPTERS/PAGES COMPLETED	—							
c. DATA SETS COMPILED	—							
5. STATE-OF-THE-ART STUDIES COMPLETED (g)	—	562	555	1,117	3,053	33,742	36,795	7,966 (p)
6. CRITICAL REVIEWS AND/OR TECHNOLOGY ASSESSMENTS COMPLETED (h)	—	—	—	—	—	—	—	—
7 CURRENT AWARENESS AND PROMOTION EFFORTS		580	695	1,275	17,121	38,475	55,596	—
a. NUMBER NEWSLETTERS AND/OR ANNOUNCEMENTS PUBLISHED (i) (j)	4/5							
b. NUMBER MEETINGS, CONFERENCES, ETC SUPPORTED	11							
8 OTHER Special Studies/Tasks (k)	2	1,210	598	1,808	25,742	116,030	141,772	45,419 (q)
9 MANAGEMENT AND SUPPORT		506	725	1,231	19,361	26,839	46,200	
10. UNASSIGNABLE INDIRECT COSTS (l)		—	—	—	—	16,212	16,212	
11. TOTAL		4,413	4,601	9,014	100,521	300,785	401,306	67,907

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FOOTNOTES FOR TABLE A-1

(a) According to Battelle definition of personnel

(b) Cost of staff time directly related to MCIC operations and special studies/tasks

(c) Costs other than direct staff time

(d) Total billed income in quarterly period. Net income received was $22,315 which included $19,975 from MCIC products and services, plus $2,340 from ManTech Journal subscriptions.

(e) Of these, 13 were on a charge basis; see "Inquiry Services" section and Appendix B

(f) None completed; see Table 3

(g) None completed; see Table 3

(h) None in process

(i) Three issues of CAB and one issue of "Review of Low-Temperature Properties of Metals"

(j) One CAB insert, two special mailings, one open-literature review, one meeting display

(k) See section on "Special Studies/Tasks", Table 8.

(l) Contractual fee

(m) Both direct and indirect income; see Table 10

(n) Cost included with technical inquiries

(o) See "Income" section, Table 10; includes handbooks and films

(p) See "Income" section, Table 10; includes reports and miscellaneous publications

(q) See Table 8 for details

TABLE A-2. THIRD ANNUAL

INFORMATION ANALYSIS CENTER CONTRACT STATUS REPORT	NAME OF INFORMATION ANALYSIS CENTER: Metals & Ceramics Information Center				QUARTER ENDING		CUMULATIVE THRU: May 80-April 81
AREA TITLE	OUTPUT UNITS PRODUCED	MANHOURS EXPENDED			COSTS INCURRED			INCOME
		PROFESSIONAL	NON-PROFESSIONAL	TOTAL	DIRECT	INDIRECT	TOTAL	
1. ACQUISITION AND INPUT OF SOURCE INFORMATION		3,149	5,193	8,342	87,037	127,429	214,466	
a. DOCUMENTS ACQUIRED	4,066							
b. DOCUMENTS REVIEWED	4,066							
c. DOCUMENTS CATALOGED	3,619							
2. TECHNICAL INQUIRY RESPONSES PROVIDED	269	1,222	472	1,694	27,428	37,173	64,601	10,957
3 BIBLIOGRAPHIC INQUIRY RESPONSES PROVIDED	44	—	—	—	—	—	—	—
4. HANDBOOKS/DATA BOOKS COMPLETED		961	965	1,926	12,282	65,451	77,733	42,282
a. NEW CHAPTERS/PAGES COMPLETED								
b. REVISED CHAPTERS/PAGES COMPLETED	4/360							
c. DATA SETS COMPILED								
5. STATE-OF-THE-ART STUDIES COMPLETED		1,415	932	2,347	22,338	60,609	82,947	33,420
6. CRITICAL REVIEWS AND/OR TECHNOLOGY ASSESSMENTS COMPLETED		—	—	—	—	—	—	—
7 CURRENT AWARENESS AND PROMOTION EFFORTS		2,134	3,219	5,353	61,795	137,694	199,489	5,200
a. NUMBER NEWSLETTERS AND/OR ANNOUNCEMENTS PUBLISHED	22/21							
b. NUMBER MEETINGS CONFERENCES, ETC SUPPORTED	30							
8 OTHER Special Studies/Tasks	4	6,276	2,561	8,837	107,320	396,476	503,796	481,973
9 MANAGEMENT AND SUPPORT		2,091	2,931	5,022	72,740	107,500	180,240	
10 UNASSIGNABLE INDIRECT COSTS		—	—	—	—	58,227	58,227	
11. TOTAL		17,248	16,273	33,521	390,940	990,559	1,381,499	573,832

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TABLE A-3. THREE-YEAR TOTAL

INFORMATION ANALYSIS CENTER CONTRACT STATUS REPORT	NAME OF INFORMATION ANALYSIS CENTER: Metals & Ceramics Information Center				QUARTER ENDING		CUMULATIVE THRU: May 78-April 81
AREA TITLE	OUTPUT UNITS PRODUCED	MANHOURS EXPENDED			COSTS INCURRED			INCOME
		PROFESSIONAL	NON-PROFESSIONAL	TOTAL	DIRECT	INDIRECT	TOTAL	
1. ACQUISITION AND INPUT OF SOURCE INFORMATION		10,930	17,934	28,864	275,384	393,031	668,415	
a. DOCUMENTS ACQUIRED	12,177							
b. DOCUMENTS REVIEWED	12,177							
c. DOCUMENTS CATALOGED	10,882							
2 TECHNICAL INQUIRY RESPONSES PROVIDED	655	3,708	1,684	5,392	80,418	105,207	185,625	46,042
3 BIBLIOGRAPHIC INQUIRY RESPONSES PROVIDED	156							
4. HANDBOOKS/DATA BOOKS COMPLETED		3,881	2,566	6,447	65,714	156,218	221,932	138,153
a. NEW CHAPTERS/PAGES COMPLETED	17/1441							
b. REVISED CHAPTERS/PAGES COMPLETED	4/360							
c. DATA SETS COMPILED								
5. STATE-OF-THE-ART STUDIES COMPLETED	5	3,368	2,904	6,272	65,694	144,370	210,064	144,299
6. CRITICAL REVIEWS AND/OR TECHNOLOGY ASSESSMENTS COMPLETED								
7 CURRENT AWARENESS AND PROMOTION EFFORTS		7,066	12,107	19,173	205,517	450,212	655,729	16,000
a. NUMBER NEWSLETTERS AND/OR ANNOUNCEMENTS PUBLISHED	79/76							
b. NUMBER MEETINGS, CONFERENCES, ETC SUPPORTED	82							
8. OTHER Special Studies/Tasks	19	19,516	7,518	27,034	318,502	996,810	1,315,312	1,527,945
9 MANAGEMENT AND SUPPORT		5,738	7,288	13,026	186,684	259,473	446,157	
10. UNASSIGNABLE INDIRECT COSTS						167,843	167,843	
11. TOTAL		54,207	52,001	106,208	1,197,913	2,673,164	3,871,077	1,872,439

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APPENDIX B

ORGANIZATIONS SERVED BY MCIC (12th QUARTER)

APPENDIX B

TABLE B-1. ORGANIZATIONS SERVICED BY MCIC

Inquiry Number	Organization and Person	Bibliographic	Service Charge	No Charge
	Industrial			
1974	Mr. P. Hansen McDonnell Douglas Huntsville, AL			X
1975	Mr. T. Forte Battelle-Columbus	X	X	
1978	Mr. P. Ruff Battelle-Columbus	X		X
1979	Mr. F. Hanyko Janney Cylinder Co. Philadelphia, PA			X
1980	Dr. A. Patel Battelle-Columbus	X	X	
1982	Mr. T. Wardlaw Titanium Metals Corp. of America Henderson, NV			X
1983	Dr. D. Peng Monsanto St. Louis, MO			X
1984	Mr. C. Wetherill Consultant Saguache, CO			X
1987	Mr. H. Smallen Aerospace Corp. El Segundo, CA			X
1988	Dr. D. Peng Monsanto St. Louis, MO		X	
1989	Mr. H. Smallen Aerospace Corp. El Segundo, CA	X	X	

TABLE B-1. (Continued)

Inquiry Number	Organization and Person	Bibliographic	Service Charge	No Charge
	Industrial (Continued)			
1990	Dr. H. Krause Battelle-Columbus	X	X	
1991	Dr. D. Hauser Battelle-Columbus	X	X	
1992	Mr. R. D'Entremont Raytheon Lowell, MA			X
1994	Mr. J. Fleisher Rockwell International Chicago, IL			X
1996	Mr. M. Wahll Battelle-Columbus	X	X	
1997	Mr. T. Groeneveld Battelle-Columbus			X
1998	Mr. L. Li ETON Corp. Deer Park, NY			X
1999	Mr. R. Stratton Pedone Engineering Corp. Lakeland, FL			X
2000	Mr. J. Maisano United Technology Windsor Locks, CT			X
2001	Mr. W. Rote General Electric Ordnance Systems Pittsfield, MA			X
2002	Mr. E. Gurber *Thiokol Corp.* Elkton, MD		X	
2003	Mr. R. Mitrano *Honeywell* Lexington, MA			X

TABLE B-1. (Continued)

Inquiry Number	Organization and Person	Bibliographic	Service Charge	No Charge
	Industrial (Continued)			
2004	Mr. L. Simmons Simmons Engineering Dallas, GA			X
2005	Mr. L. Higgins Rockwell International Downey, CA			X
2007	Mr. F. Mahler Teledyne CAE Toledo, OH			X
2008	Mr. R. Queen Dresser Industries/Jeffery Div. Columbus, OH	X	X	
2009	Mr. W. Wheeler Analysis & Design Applications Melville, NY		X	
2010	Mr. K. Kennedy Clark Industries Buchanan, MI			X
2011	Mr. C. Nichols Cypress Metallurgical Processing Corp. Tucson, AZ			X
2012	Dr. A. Patel Battelle-Columbus	X		X
2013	Mr. J. James Ford Aeronutronics Newport Beach, CA			X
2014	Mr. W. Wheeler Analysis & Design Applications Melville, NY			X
2016	Mr. L. Milco Ampax Sunnyvale, CA			X

TABLE B-1. (Continued)

Inquiry Number	Organization and Person	Bibliographic	Service Charge	No Charge
	Industrial (Continued)			
2017	Mr. C. Schultz Babcock & Wilcox Research Center Alliance, OH			X
2018	Mr. R. Fee Lear Fan Reno, NV			X
2019	Mr. F. Schneider Lewis Eisner & Co. New York, NY			X
2021	Mr. D. Goslee Cordis Corp. Miami, FL			X
2022	Mr. A. Federico North American Rockwell Columbus, OH			X
2023	Mr. H. Smallen Aerospace Corp. El Segundo, CA			X
2024	Mr. W. Shirk Korda Engineering Columbus, OH			X
2025	Research Department S. K. Wellman Company Bedford, OH			X
2026	Mr. R. Fannon Battelle-Columbus		X	
2029	Mr. M. Pobereskin Battelle/ONWI			X
2030	Mr. G. Carter Medical Engineering Corp. Racine, WI			X

TABLE B-1. (Continued)

Inquiry Number	Organization and Person	Bibliographic	Service Charge	No Charge
	Industrial (Continued)			
2031	Ms. M. Oedell Powell Metals & Chemicals Rockford, IL			X
2032	Dr. F. Buttner Battelle-Columbus	X	X	
2033	Mr. H. Bertram Bertram Tool & Machine Co. Farrell, PA			X
2034	Ms. J. Bookmeyer PPG Glass Research Pittsburgh, PA			X
2036	Ms. M. Gleason United Technologies/Hamilton Standard Windsor Locks, CT			X
2037	Mr. R. Giles Maremont Co. Saco, ME			X
	Government			
1981	Mr. P. Smoot AMMRC Watertown, MA			X
1986	Mr. J. Adachi AMMRC Watertown, MA	X	X	
1993	Mr. M. Levinsohn NASA-Goddard Greenbelt, MD			X
2006	Mr. N. Promisel (Consultant) National Materials Advisory Board Washington, DC	X		X

TABLE B-1. (Continued)

Inquiry Number	Organization and Person	Bibliographic	Service Charge	No Charge
	Government (Continued)			
2015	Lt. Comm. J. McNamee U.S. Navy/MIT Cambridge, MA	X		X
2020	Mr. M. Levinsohn NASA-Goddard Greenbelt, MD			X
2028	Ms. S. Macksey AMMRC Watertown, MA			X
	Foreign			
1977	Mr. D. Palmer British Embassy Washington, DC			X
1985	Engineering Manager Ushamil Alloy Steel New Delhi, India			X
1995	Mr. N. Richards Bristol Aerospace Ltd. Winnipeg, Canada			X

APPENDIX C

SALES OF MCIC REPORTS, HANDBOOKS, AND SPECIAL REPORTS

Third Annual Sales — Tables C-1, C-2, C-3

Twelfth Quarter Sales — Tables C-4, C-5, C-6

TABLE C-1. ANNUAL SALES OF MCIC TECHNICAL REPORTS

DOCUMENT	DOCUMENT TITLE		NUMBER SOLD (NTIS)	NUMBER SOLD (MCIC)	NUMBER SOLD (TOTAL)	NUMBER SOLD (CUML)
7101	EFF OF SURF COND ON MECH PROP TI+ALLOYS	AUG71	9	12	21	996
7102	EFF SHOT PEEN ON IMP, FAT+STR CORR PROP	DEC71	13	24	37	1,165
7203	NONTRADITIONAL MACHINING OF BERYLLIUM	JAN72	4	10	14	251
7204	CRACK BEHAVIOR IN D6AC STEEL	JAN72	2	3	5	403
7205	SYMP ON PROP OF ELECT DEP METALS	JAN72	4	3	7	908
7206	IMPURITY EFFECTS IN BERYLLIUM	MAR72	2	5	7	148
7207	OXIDATION OF FE-NI + COBALT BASE ALLOYS	JUN72	1	5	6	602
7208	HOT CORROSION IN GAS TURBINES	JUN72	12	9	21	659
7209	BIBLIO ON FIBERS + COMP MATLS 1969-72	JUL72	10	9	19	671
7210	SUPERALLOYS-PROCESSING (CONF PROC.)	SEP72	11	21	32	621
7211	BETA TITANIUM ALLOYS	SEP72	10	9	19	346
7212	FRAC ANAL BY SCANNING ELEC MICROSCOPY	DEC72	25	1	26	1,523
7313	ADV IN JOINING TECH - 60'S + BEYOND	JAN73	8	0	8	789
7314	MATLS FOR USE IN AIRCRAFT GAS TURB ENG	JUN73	9	14	23	664
7315	METALLURGY OF FUSION-WELD REPAIR	AUG73	3	6	9	666
7316	TITANIUM CASTING TODAY	DEC73	7	11	18	297
7319	PROC 72 TRI-SERV CONF ON CORROSION	DEC73	2	0	2	366
7417	PROC 73 SYMP ELEC-DEP METAL SEL APPLI	APR74	0	3	3	407
7413	METAL IMPLANTS FOR ORTHO + DENTAL SURG	FEB74	5	0	5	477
7420	PROPERTIES OF TEXTURED TITANIUM ALLOYS	JUN74	9	6	15	244
7421	CERA PROSTH APPL-ORTHO DENTAL+CARDIOV	JUL74	5	1	6	241
7422	NONDESTRUCTIVE TESTING OF BERYLLIUM	JUL74	5	4	9	99
7423	CORROSION OF METALS IN THE ATMOSPHERE	AUG74	16	11	27	587
7424	AUTOMATION IN WELDING	OCT74	4	0	4	283
7525	CRACKS AT STRUCTURAL HOLES	MAR75	5	9	14	256
7526	TITANIUM INDUSTRY IN THE MID 70'S	JUN75	2	11	13	350
7527	PROC 74 GAS TURB MATLS N MAR ENVIR CONF	JUL75	2	5	7	295
7628	PROC + APPLI OF DEPL URAN ALLOY PROD	SEP76	6	11	17	167
7729	ANNOT BIBLIO SIL NIT FOR STRUC APPLI	MAR77	0	0	0	191
7730	DISPERSION STRENGTHENING OF METALS	APR77	3	6	9	283
7731	LOW TEMP PROP SEL MATLS-BIBLIO W/DESCR	MAY77	4	7	11	177
7732	EFF RAP HEAT PROP MATLS-BIBLIO W/DESCR	JUN77	6	9	15	270
7733	PROC 76 TRI-SERV CONF ON CORROSION	DEC77	3	5	8	192
7734	HOT ISOSTATIC PROCESSING	NOV77	20	181	201	1,006
7835	RHEOCASTING	JAN78	11	37	48	238
7836	PROC DARPA/NAVSEA CER GASTURB DEM	MAR78	9	11	20	483
7837	CORROSION OF METALS IN MARINE ENVIRO	MAR78	33	118	151	740
7839	BIBLIO ON FIBERS + COMPOSITE MATLS	NOV78	0	43	43	274
7939	REVIEW METALL HI-STREN LOW-ALLOY STEEL	APR79	33	92	125	356
7940	TRI-SERV CORROSION CONF-78	JUL79	20	32	52	197
7941	SILICON NITRIDE BIB	JUL79	48	37	85	192
	TYPE TOTAL		381	781	1,162	13,032

TABLE C-2. ANNUAL SALES OF MCIC HANDBOOKS AND DATABOOKS

FOR PERIOD 05/01/80 THRU 04/30/81

DOCU-MENT	DOCUMENT TITLE		NUMBER SOLD (NTIS)	NUMBER SOLD (MCIC)	NUMBER SOLD (TOTAL)	NUMBER SOLD (COUMU)
HB01	DAMAGE TOLERANT DESIGN HANDBOOK	DEC72	0	47	47	1,338
HB01S1	1ST SUPP TO D-T-D HANDBOOK	DEC73	0	57	57	869
HB01S2	2ND SUPP TO D-T-D HANDBOOK	JAN75	0	62	62	756
HB02	TITANIUM ALLOYS HANDBOOK	DEC72	21	34	55	1,151
HB03	FORGING--EQUIP, MATLS, + PRACTICES	OCT73	52	152	204	1,633
HB04	HDBK ON MATLS FOR SUPERCONDUCTING MACH.	NOV74	2	16	18	410
HB04S1	1ST SUPP TO HDBK ON M-S-M	NOV75	6	23	29	298
HB04S2	2ND SUPP TO HDBK ON M-S-M	JAN77	5	27	32	252
HB05	SOVIET ALLOY HANDBOOK	FEB75	3	71	74	718
HB05S1	1ST SUPP TO SOVIET ALLOY HDBK	APR76	3	8	11	306
HB06	SEM/TEM FRACTOGRAPHY HANDBOOK	DEC75	13	33	46	963
HB07V1	ENGRG PROP DATA ON CERAMICS-V1 NITRIDES	MAR76	12	59	71	550
HB07V2	ENGRG PROP DATA ON CERAMICS-V2 CARBIDES	AUG79	20	116	136	229
HB08	ELECTRON FRACTOGRAPHY HANDBOOK	JUN76	9	19	28	455
HB09V1	HDBK OF INTNL ALLOY COMP+DESIG.-V1 TI	NOV76	14	22	36	454
HB09V2	HDBK INTNL AL. COMP+DES- V2 SUPERALLOY	DEC78	4	54	58	414
	TYPE TOTAL		164	800	964	10,736

TABLE C-3. ANNUAL SALES OF MCIC SPECIAL REPORTS

FOR PERIOD 05/01/80 THRU 04/30/81

DOCU-MENT	DOCUMENT TITLE		NUMBER SOLD (NTIS)	NUMBER SOLD (MCIC)	NUMBER SOLD (TOTAL)	NUMBER SOLD (CUML)
AMTC 1	AMMRC BKS - SOLID TECH	OCT72	0	27	27	104
AMTC 2	AMMRC BKS - CERAMICS FOR HI PERF APPL I	NOV73	0	37	37	73
AMTC 3	AMMRC BKS - PHY MET URAN ALLOYS	FEB74	0	14	14	37
AMTC 4	AMMRC BOOKS - AMTC NO 4 - JOINING	SEP75	0	46	46	319
AMTC 5	AMMRC BKS - CERAMICS FOR HI PERF APPL II	MAR77	0	56	56	173
HELRG2	SURVEY ON MECH PROP ON RAPID HEATING	JUL76	0	0	0	17
HELRG3	SURV ON MECH PROP ON RAPID HEAT HDBK	FEB78	0	0	0	12
MTC 78	1978 MATERIALS TECHNOLOGY REPORT	FEB78	0	1	1	251
SPEC	MISC REPORTS	JUL79	0	4	4	116
SR7501	MATERIALS SHORTAGE WORKSHOP PROCEEDINGS	FEB75	0	2	2	152
SR7502	BERYLLIUM-UTILIZATION/AVAILABILITY	JUL75	0	1	1	1
SR7606	WORKSHOP ON GOVT POLICIES & PROGRAMS	MAR76	0	2	2	286
STC 76	1976 STRUCTURES TECHNOLOGY REPORT	NOV76	0	1	1	352
	T Y P E T O T A L		0	191	191	1,895

N O T E : NTIS DOES NOT SELL THESE DOCUMENTS.

TABLE C-4. TWELFTH QUARTER SALES OF MCIC TECHNICAL REPORTS

FOR PERIOD 02/01/91 THRU 04/30/91

DOCU-MENT	DOCUMENT TITLE		NUMBER SOLD (NTIS)	NUMBER SOLD (MCIC)	NUMBER SOLD (TOTAL)	NUMBER SOLD (CUML)
7101	EFF OF SURF COND ON MECH PROP TI+ALLOYS	AUG71	2	3	5	396
7102	EFF SHOT PEEN ON IMP, FAT+STR CORR PROP	DEC71	2	9	11	1,165
7203	NONTRADITIONAL MACHINING OF BERYLLIUM	JAN72	0	1	1	251
7204	CRACK BEHAVIOR IN D6AC STEEL	JAN72	1	1	2	403
7205	SYMP ON PROP OF ELECT DEP METALS	JAN72	0	0	0	308
7206	IMPURITY EFFECTS IN BERYLLIUM	MAR72	0	0	0	145
7207	OXIDATION OF FE-NI + COBALT BASE ALLOYS	JUN72	0	1	1	602
7208	HOT CORROSION IN GAS TURBINES	JUN72	1	5	6	659
7209	BIBLIO ON FIBERS + COMP MATLS 1969-72	JUL72	2	2	4	671
7210	SUPERALLOYS-PROCESSING (CONF PROC.)	SEP72	2	4	6	621
7211	BETA TITANIUM ALLOYS	SEP72	1	3	4	346
7212	FRAC ANAL BY SCANNING ELEC MICROSCOPY	DEC72	1	0	1	1,523
7313	ADV IN JOINING TECH - 60'S + BEYOND	JAN73	1	0	1	789
7314	MATLS FOR USE IN AIRCRAFT GAS TURB ENG	JUN73	2	4	6	684
7315	METALLURGY OF FUSION-WELD REPAIR	AUG73	1	2	3	666
7316	TITANIUM CASTING TODAY	DEC73	2	4	6	297
7319	PROC 72 TRI-SERV CONF ON CORROSION	DEC73	0	0	0	366
7417	PROC 73 SYMP ELEC-DEP METAL SEL APPLI	APR74	0	1	1	407
7416	METAL IMPLANTS FOR ORTHO + DENTAL SURG	FEB74	1	0	1	477
7420	PROPERTIES OF TEXTURED TITANIUM ALLOYS	JUN74	1	1	2	244
7421	CERA PROSTH APPL-ORTHO DENTAL+CARDIOV	JUL74	0	1	1	241
7422	NONDESTRUCTIVE TESTING OF BERYLLIUM	JUL74	1	0	1	99
7423	CORROSION OF METALS IN THE ATMOSPHERE	AUG74	4	5	9	587
7424	AUTOMATION IN WELDING	OCT74	1	0	1	283
7525	CRACKS AT STRUCTURAL HOLES	MAR75	2	2	4	258
7526	TITANIUM INDUSTRY IN THE MID 70'S	JUN75	1	5	6	350
7527	PROC 74 GAS TURB MATLS N MAR ENVIR CONF	JUL75	0	2	2	295
7620	PROC + APPLI OF DEPL URAN ALLOY PROD	SEP76	3	2	5	107
7729	ANNOT BIBLIO SIL NIT FOR STRUC APPLI	MAR77	0	0	0	191
7730	DISPERSION STRENGTHENING OF METALS	APR77	1	1	2	283
7731	LOW TEMP PROP SEL MATLS-BIBLIO W/DESCR	MAY77	2	3	5	177
7732	EFF RAP HEAT PROP MATLS-BIBLIO W/DESCR	JUN77	1	5	6	270
7733	PROC 76 TRI-SERV CONF ON CORROSION	DEC77	0	0	0	192
7734	HOT ISOSTATIC PROCESSING	NOV77	3	42	45	1,006
7835	RHEOCASTING	JAN78	1	5	6	238
7836	PROC DARPA/NAVSEA CER GASTURB DEM	MAR78	1	4	5	483
7837	CORROSION OF METALS IN MARINE ENVIRO	MAR78	5	17	22	740
7838	BIBLIO ON FIBERS + COMPOSITE MATLS	NOV78	0	6	6	274
7939	REVIEW METALL HI-STREN LOW-ALLOY STEEL	APR79	3	11	14	356
7940	TRI-SERV CORROSION CONF-78	JUL79	3	5	8	187
7941	SILICON NITRIDE BIB	JUL79	2	3	5	192
	TYPE TOTAL		54	160	214	19,132

TABLE C-5. TWELFTH QUARTER SALES OF MCIC HANDBOOKS AND DATABOOKS

FOR PERIOD 02/01/81 THRU 04/30/81

DOCU-MENT	DOCUMENT TITLE		NUMBER SOLD (NTIS)	NUMBER SOLD (MCIC)	NUMBER SOLD (TOTAL)	NUMBER SOLD (CUML)
HB01	DAMAGE TOLERANT DESIGN HANDBOOK	DEC72	0	11	11	1,336
HB01S1	1ST SUPP TO D-T-D HANDBOOK	DEC73	0	11	11	969
HB01S2	2ND SUPP TO D-T-D HANDBOOK	JAN75	0	12	12	758
HB02	TITANIUM ALLOYS HANDBOOK	DEC72	2	8	10	1,151
HB03	FORGING--EQUIP, MATLS, + PRACTICES	OCT73	9	32	41	1,633
HB04	HDBK ON MATLS FOR SUPERCONDUCTING MACH.	NOV74	0	2	2	410
HB04S1	1ST SUPP TO HDBK ON M-S-M	NOV75	0	5	5	298
HB04S2	2ND SUPP TO HDBK ON M-S-M	JAN77	1	6	7	252
HB05	SOVIET ALLOY HANDBOOK	FEB75	2	45	47	718
HB05S1	1ST SUPP TO SOVIET ALLOY HDBK	APR76	0	0	0	306
HB06	SEM/TEM FRACTOGRAPHY HANDBOOK	DEC75	1	10	11	963
HB07V1	ENGRG PROP DATA ON CERAMICS-V1 NITRIDES	MAR76	4	19	23	550
HB07V2	ENGRG PROP DATA ON CERAMICS-V2 CARBIDES	AUG79	18	27	45	229
HB08	ELECTRON FRACTOGRAPHY HANDBOOK	JUN76	2	4	6	455
HB09V1	HDBK OF INTNL ALLOY COMP+DESIG.-V1 TI	NOV76	0	2	2	454
HB09V2	HDBK INTNL AL. COMP+DES- V2 SUPERA.LOY	DEC78	1	7	8	414
	T Y P E T O T A L		40	201	241	10,799

TABLE C-6. TWELFTH QUARTER SALES OF MCIC SPECIAL REPORTS

FOR PERIOD 02/01/81 THRU 04/30/81

DOCUMENT	DOCUMENT TITLE		NUMBER SOLD (NTIS)	NUMBER SOLD (MCIC)	NUMBER SOLD (TOTAL)	NUMBER SOLD (CUML)
AMTC 1	AMMRC BKS - SOLID TECH	OCT72	0	3	3	104
AMTC 2	AMMRC BKS - CERAMICS FOR HI PERF APPL I	NOV73	0	10	10	73
AMTC 3	AMMRC BKS - PHY MET URAN ALLOYS	FEB74	0	3	3	37
AMTC 4	AMMRC BOOKS - AMTC NO 4 - JOINING	SEP75	0	7	7	319
AMTC 5	AMMRC BKS - CERAMICS FOR HI PERF APPL II	MAR77	0	16	16	173
HELR32	SURVEY ON MECH PROP ON RAPID HEATING	JUL76	0	0	0	17
HELR33	SURV ON MECH PROP ON RAPID HEAT HDBK	FEB78	0	0	0	12
MTL 78	1978 MATERIALS TECHNOLOGY REPORT	FEB78	0	0	0	251
SPEC	MISC REPORTS	JUL79	0	2	2	116
SR7501	MATERIALS SHORTAGE WORKSHOP PROCEEDINGS	FEB75	0	1	1	152
SR7502	BERYLLIUM-UTILIZATION/AVAILABILITY	JUL75	0	1	1	1
SR7606	WORKSHOP ON GOVT POLICIES + PROGRAMS	MAR76	0	0	0	288
STC 76	1976 STRUCTURES TECHNOLOGY REPORT	NOV76	0	0	0	352
	TYPE TOTAL		0	43	43	1,995

NOTE: NTIS DOES NOT SELL THESE DOCUMENTS.

APPENDIX D

TECHNICAL PERSONNEL ASSOCIATED WITH MCIC PRODUCTS & SERVICES (12th QUARTER)

APPENDIX D

TECHNICAL PERSONNEL ASSOCIATED WITH MCIC PRODUCTS & SERVICES (12th QUARTER)

Personnel	Titles	Area of Specialization
	INQUIRIES	
Bartlett, E. S.	Staff Metallurgist	Refractory Metals Technology
Berry, W. E.	Section Manager	Corrosion
Campbell, J. E.	Staff Engineer/Consultant	Fracture Mechanics
Deel, O. L.	Staff Scientist	Design Properties
DeSaw, F. A.	Staff Metallurgist	Metals Joining
Eiber, R. N.	Staff Scientist	Properties
Endebrock, R.	Information Manager	Information Handling
Green, C. A.	Information Specialist	Information Handling
Gurklis, J. A.	Staff Scientist	Surface Treatments
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